

**Chapter 570****COMBINED SEWER OVERFLOW ABATEMENT**

**SUMMARY:** This chapter establishes procedures for licensees with Combined Sewer Overflow (CSO) discharges to evaluate current conditions, determine impacts, study control technologies, analyze financial concerns and prepare a "Master Plan" for a CSO program. Additionally, the chapter sets forth interim minimum controls to reduce CSO activity and pollutant discharges while long-range plans are being completed.

- 1. Criteria for acceptable CSOs.** A discharge from a combined overflow point within a sewerage system is permitted only when the discharge meets the following conditions.
  - A. Discharge in excess of design capacity.** The discharge consists of wastewater in excess of design capacity of a municipal or quasi-municipal sewerage system, including pumps or treatment facilities, that conveys both sanitary wastes and stormwater in a single pipe system and that is in direct response to a storm event or snow melt.
  - B. Discharge not due to mechanical failure.** The discharge is not the result of mechanical failure, improper design or inadequate operation or maintenance.
  - C. CSO Master Plan.** The licensee is actively developing or implementing a CSO Master Plan in accordance with this chapter, and as approved by the department; or the licensee has implemented the CSO Master Plan and a discharge occurs that is caused by conditions exceeding those upon which the Plan is based.
- 2. Scope of work for CSO Master Plan.** A scope of work setting out the level of effort for the proposed CSO Master Plan must be submitted to the department for review and approval. This scope of work must conform with this chapter, but may be modified or reduced, as approved by the department, based on local conditions and circumstances
- 3. Elements of a CSO Master Plan.** The following elements must be included in a CSO Master Plan by the licensee.
  - A. CSO assessment and monitoring.** The complexity of sewerage systems and CSO discharge situations varies greatly from one community to another. Consequently, it is recognized that the scope and magnitude of assessment and monitoring needs must be adapted to each individual community. The description of activities below is intended to reflect the magnitude and nature of assessment and monitoring which may be done in a comprehensive study. Depending on individual community needs, a licensee may expect to tailor an individual program. Not all activities will be required of all licensees.
    - (1) The CSO assessment is conducted to determine existing conditions and sewerage system characteristics. The assessment may include, but is not limited to:

- (a) Mapping of the existing sewer system and descriptions of flow control structures, pumping stations and treatment facilities;
  - (b) Reviewing current operational practices and identifying known problems or system shortcomings;
  - (c) Describing drainage areas served by the sewerage system, including land uses and significant sources of wastewater;
  - (d) Locating wastewater discharges and CSO discharge points to receiving waters within the study area; and
  - (e) Describing and mapping receiving waters, with particular attention to existing and designated uses under state water quality standards, characterization of historic impairments of uses, and identification of high value or potential uses that may be realized with CSO abatement.
- (2) CSO discharge points must be observed and either flow monitored or modeled over a period of time sufficient to reflect a wide range of storm events and antecedent conditions in order to determine CSO activity. Additionally, flow monitoring must be conducted at a number of locations adequate to allow estimation of flows within the entire sewer system. Flow monitoring must be representative of the sewerage system's drainage area and include varied land uses, unless otherwise approved by the department. The number and location of flow monitoring points and will vary with characteristics of individual systems and the means used to evaluate the system. Also, the period of monitoring time needed to obtain sufficient data will vary depending on the weather conditions. Typically, the use of computer modeling of a system will reduce the need for flow monitoring.
- (3) In conjunction with flow monitoring, testing is to be conducted on flow-weighted, composite samples, or grab samples, depending on applicability, to determine pollutant loads. Samples must be collected to characterize the so-called first flush, and the total discharge volume. Samples must be analyzed for total suspended solids, biochemical oxygen demand and bacteria. The department, on the basis of receiving water sensitivity, known discharge constituents of concern, or local concerns, may specify analysis for other pollutants. Normally, samples must be collected during four separate discharge events, two in the spring and two in the summer, at each location.
- (4) A sampling program must be conducted to determine the impact of CSO discharges on the receiving water. Sampling locations must be selected to reflect typical conditions and the impact on existing local uses including contact recreation and boating. Unless warranted by particular receiving water quality concerns, samples must be analyzed for bacteria only. Sampling is not required for bacteria if the licensee informs the department that water quality impacts exist by specifying the nature, area and duration of impacts due to CSO discharges.

The department, upon receiving information characterizing CSO discharges, shall assist the licensee in assessing area-wide impacts.

- (5) Concurrent with CSO monitoring, evaluation of the sewer system must be conducted to identify sources of extraneous water entering the system. To the extent they are available,

previous inflow/infiltration analyses or other sewer system studies may be used when appropriate.

- (6) Along with monitoring and assessment, public comment and involvement must be sought. Particular consideration must be given to identifying public goals, potential designated uses and priorities for use of receiving waters and CSO abatement technologies.

**B. Prioritization and alternative analysis.** A major element of a CSO Master Plan is the identification of existing and potential high value uses. The involvement of the public is essential during this identification and prioritization process. The Master Plan must place high priority on abatement of combined sewer overflows that affect waters having the greatest potential for public use or benefit and attempt to relocate any remaining discharges to areas where minimal impacts or losses of uses would occur. Another major element of a CSO Master Plan is a thorough analysis of alternatives for CSO abatement, which includes a financial capability analysis to determine user cost of the recommended alternative, and an implementation schedule for the recommended abatement program.

- (1) Prioritization of CSO discharge abatement must be based on data from the CSO assessment and monitoring program, and any other existing relevant data. Priorities for abatement include, but are not limited to the following list, shown in order of importance. The order and number of items may change, as determined by the department, if a licensee shows justification for the change.
  - (a) Discharges that occur during dry weather periods;
  - (b) Discharges that may impact public drinking water intakes;
  - (c) Discharges that may impair water contact recreational uses or create public health concerns in the receiving waters;
  - (d) Discharges that discharge into areas determined to have redeemable shellfish resources or important fish or wildlife habitat;
  - (e) Discharges that contain industrial or medical wastes;
  - (f) Discharges that function during the months of June through September;
  - (g) Discharges that cause localized nuisance conditions; and
  - (h) All other CSO discharges.
- (2) The licensee shall conduct an evaluation of a full range of control alternatives.
  - (a) These alternatives must include, but are not limited to:
    - (i) Pollution prevention practices to reduce, control, or eliminate pollutants at their source and prior to entry into the sewerage system;

- (ii) Removing sources of uncontaminated water introduced into the sewerage system from private and public sources;
  - (iii) Maximizing the existing sewerage system for storage, transport and treatment of wastewater;
  - (iv) Off-line storage or retention of excess flow for addition to the sewerage system as its capacity allows;
  - (v) Sewer separation to remove stormwater from sanitary wastewater;
  - (vi) Full elimination of CSOs;
  - (vii) Treatment of CSOs (see Section 4); and
  - (viii) Discharge point relocation to less sensitive receiving waters.
- (b) This evaluation process consists of the following steps:
- (i) Developing a list of available control measures; and
  - (ii) Screening the list to eliminate those measures that for various reasons would not warrant further consideration for the given application. The list of available control measures must be developed by evaluating each measure's ability to reduce pollutants of concern that would cause violations of water quality standards. The pollutants would have previously been identified during the CSO Assessment and Monitoring Phase (see Section 3(A)).

The list of available control measures must be screened using appropriate criteria. Typical screening criteria can be considered under these main categories:

- a. Performance factors, relating to the effectiveness of control measures;
- b. Implementation and operation factors, relating to the licensee's ability to implement and manage the control measures;
- c. Environmental impacts, relating to possible negative side-effects from constructing control measures; and
- d. Comparative capital and operation and maintenance costs, with an analysis of the licensee's ability to pay for such costs.

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NOTE: This screening criteria, along with the use of Best Management Practices and the prioritization of high value use areas, allow the community to focus on the most appropriate control measures to solve its specific CSO control needs.

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- (iii) CSO discharges that will remain following implementation of a Master Plan must be located to receive maximum dispersion and dilution or maximum environmental benefit in the receiving water. All efforts must be made to locate these discharge points away from sensitive areas or high value uses in the receiving water or where existing or expected uses may be impaired.
  - (iv) The effectiveness of current and potential best management practices (see Section 5) must be evaluated.
  - (v) A financial capability analysis must be completed to evaluate the impact of proposed CSO abatement alternatives on sewer user rates. The analysis must show the proposed residential user charge as a percentage of the Medium Household Income (MHI) for the community.
  - (vi) A plan must be included that accommodates projected additions to the sewer system while maintaining CSO abatement goals and implementation timetables.
- (3) Adequate public participation efforts must be made during and after the planning process.
- (a) Development of the Master Plan and subsequent reviews and updates must include public participation efforts that are adequate to inform and receive comments from persons interested in water quality or abatement issues associated with CSO discharges. These efforts must include providing the public with information on CSO assessments, water quality impacts, abatement alternatives, and costs and related issues. Public discussion of water quality, current receiving water uses, desired potential uses, priority of uses, acceptable abatement technologies and financial capability must be sought. The licensee must hold a public hearing on the Master Plan and provide the department with a record of the hearing, a list of people in attendance, copies of written testimony and the licensee's responses to the issues raised. The hearing must be advertised no less than 30 days nor more than 45 days prior to the hearing in a local newspaper of general circulation in the area affected by CSO discharges. Concurrent with the advertisement, a notice of the public hearing must be sent to all persons who have expressed an interest in the Master Plan. A licensee that plans to apply for State Revolving Fund (SRF) loans must comply with public hearing requirements in the State of Maine Revolving Loan Fund Rules, Chapter 595. Records of public participation efforts and the public hearing must be maintained and be available to the department.
  - (b) In cases where a CSO may cause continuing or future impairment of water quality criteria or uses, the licensee of these discharges must institute ongoing efforts to inform the public of those impacts. The means and frequency of notices must be specific to the geographic area and uses involved in order to gain maximum public awareness. However, a minimum notification program must consist of:
    - (i) Timely annual publication of prominent notices in newspapers having general circulation in the area affected by CSO discharges;
    - (ii) Posting of permanent signs, where feasible, at locations that afford public access to water affected by CSO discharges such as parks and boat launches; and

- (iii) Direct written contact with persons known to have particular interest in the use of land or waters affected by CSO discharges.

In individual situations, other comparable means of public notification may be substituted for those above if they are shown to be equally effective.

All notices must include a description of the area and uses impacted by CSO discharges, the nature, times and conditions of impacts, and precautions that should be observed by the public.

- C. Implementation schedule.** An implementation schedule for completion of recommended CSO abatement technologies and programs must be included. Due to the nature of emerging CSO abatement technologies, changing growth patterns and financial conditions within communities, and other unforeseen factors, the schedule must include periodic updates and reviews of the Master Plan. These updates allow the licensee to modify the implementation plan based on results of the continuing monitoring program (see Section 6) and experience gained, while keeping focused on the original goals of the Master Plan. A length of time between reviews of three to five years may be reasonable, depending on progress made on implementation of the Master Plan.
  - D. Proposed Budget.** A proposed budget needed to accomplish the recommended CSO abatement implementation program must be included.
- 4. State established best practicable treatment for CSO discharges.** Where end of pipe treatment is used, it must remove settleable and floatable solids at rates equivalent to that achieved by conventional primary clarification plus, where required, disinfection. If chlorine is used, and total chlorine residual values fail to meet license limits, the department may require dechlorination.
  - 5. Nine minimum controls (NMC).** The licensee must implement the following nine minimum controls (NMC), developed by EPA, that can be beneficially and practically implemented as determined by the department.
    - A. Operation and maintenance.** Proper operation of and regular maintenance programs for the sewer system and CSO outfalls.
    - B. System storage.** Maximum use of the collection system for storage.
    - C. Pretreatment.** Review and modification of pretreatment requirements to ensure that CSO impacts are minimized.
    - D. Flow maximization.** Maximization of flow to the publicly owned treatment works (POTW) for treatment.
    - E. No dry weather CSOs.** Elimination of CSOs during dry weather.
    - F. Solids and floatables control.** Low cost control of solid and floatable materials in CSOs.
    - G. Pollution prevention.** Pollution prevention programs to reduce contaminants in CSOs.

**H. Public notification.** Public notification to ensure adequate knowledge of CSO occurrences and CSO impacts.

**I. Monitoring.** Monitoring to characterize CSO impacts and the effectiveness of CSO controls.

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NOTE: For guidance see EPA's CSO Guidance for Nine Minimum Controls, dated May, 1995, which more fully describes the nine minimum controls.

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- 6. CSO compliance monitoring program.** As part of the Master Plan, a program for continued monitoring of CSO discharges must be submitted to the department for approval. The licensee must conduct block testing and flow monitoring according to the approved Compliance Monitoring Plan. This monitoring information must consist of precipitation from storm events or snow melt flows that cause CSOs, overflow volumes and overflow events for the period of January 1 to December 31 of each year. The department shall use this information and yearly progress reports to measure the effectiveness of the CSO abatement program. The information must be submitted on a form entitled "CSO Volumes and Activity", supplied by the department (or a similar format), and must be part of the annual CSO progress report (see Section 7). Annual flow volumes for the previous year from all CSO locations must be determined by actual flow monitoring, or by estimation using a model such as EPA's Storm Water Management Model (SWMM). CSO control projects that have been completed must be monitored for volume and frequency of overflow to determine the effectiveness of the project toward CSO abatement. This requirement does not apply to those areas where complete separation has been completed and CSO outfalls have been eliminated. Based on the results of monitoring and experiences gained from implementation of abatement projects, the licensee shall periodically (every three to five years) review and update the Master Plan (see Section 3(C)).
- 7. CSO progress reports.** The licensee must submit yearly CSO progress reports covering the previous calendar year.

The CSO progress report must include but is not necessarily limited to, the following topics.

- A. CSO abatement projects.** CSO abatement projects including milestone dates such as design start and completion and construction start and completion.
- B. Schedule comparison.** A comparison of the existing schedule with the department approved implementation schedule. If the existing schedule is behind the approved schedule, list the reasons why, and how the licensee proposes to catch up in order to comply with the approved schedule.
- C. Progress on inflow sources.** Progress made on locating and removing private inflow sources, such as roof leaders and basement sump pumps.
- D. Costs.** Total cost and local share of CSO abatement projects to date, plus an anticipated budget for projects in the next year.
- E. Flow monitoring results.** Results of any specific flow monitoring to determine effectiveness of previous CSO abatement projects. Compare actual CSO abatement with projections made during the CSO Master Plan.

- F. CSO activity and volumes.** Yearly precipitation, CSO volumes (actual or estimated), and any block test data (see Section 6) submitted on department form titled "CSO Activity and Volumes". The form must be submitted on diskette, if possible, to allow easy data entry. Report any abnormalities during CSO monitoring.
- G. Nine minimum controls update.** Work done on the Nine Minimum Controls during the year including, but not limited to the following.
- (1) Results of operation and maintenance programs for the sewer system and combined sewer overflows during the year, such as, frequency of regulator inspections, number of catch basins cleaned, and feet of sewer cleaned or repaired, with estimates of material removed, if possible.
  - (2) Low cost projects to maximize use of the collection system for storage or to maximize flow to the POTW for treatment.
  - (3) Modifications to the pretreatment program to assure the CSO impacts are minimized.
  - (4) Low cost projects that maximize flow to the POTW for treatment.
  - (5) Documentation that no CSO discharges occurred during dry weather.
  - (6) Projects to control solid and floatable materials in CSO discharges.
  - (7) Pollution prevention programs that focus on contaminant reduction activities.
  - (8) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.
  - (9) Any monitoring and sampling results to effectively characterize CSO impacts and the effectiveness of CSO controls.
- H. Sewer extensions and new commercial or industrial flows.** List the sewer extensions and new commercial or industrial flows added during the year, along with what mitigating measures were accomplished to prevent these flows from contributing to CSOs (see Section 8).

## **8. Addition of new wastewater**

- A. When allowed.** Unless the department determines that the nature or the volume of additional wastewater will adversely affect existing water quality of the receiving water, new sources of wastewater may be added to a sewer system having a CSO discharge point if:
- (1) The licensee is conducting a CSO Master Plan study on a schedule approved by the department;
  - (2) The licensee is implementing the approved Master Plan; or
  - (3) The licensee has completed implementation of the approved Master Plan.



**B. Review and documentation.** In the cases of Section 8(A)(2) and Section 8(A)(3) above, the licensee must implement additional abatement measures, if necessary, to ensure that the additional wastewater will not exceed the targeted level of control or extend the implementation schedule in the approved Master Plan (see Section 3(B)(2)(b)(vi)). In the case of Section 8(A)(1) above, the licensee must document practices, measures, or programs to mitigate impacts to the combined sewer system from the added wastewater. The licensee must consider, but is not limited to any combination of the following:

- (1) Implementation of the nine minimum controls as described in Section 5, above;
- (2) Removal of extraneous, uncontaminated water from private or public sources;
- (3) Physical improvements, alterations, or upgrades that result in reduced CSO activity;
- (4) Pollution prevention programs; or
- (5) Sewer separation projects.

**C. Submissions.** Documentation of additions of wastewater to the combined sewer system, and associated mitigating measures must be included in the yearly CSO progress reports (see Section 7(H)). Reports must contain the volumes and characteristics of wastewater added or authorized for addition and descriptions of sewer system improvements and estimated effectiveness.

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NOTE: Stormwater runoff may contain various pollutants. Before separation projects are carried out, care should be taken to assure runoff borne pollutants are not simply redirected to the receiving water through another piping system. This is of particular concern in heavily developed areas where pollutant concentrations are likely to be higher. Licensees proposing sewer separation projects should investigate methods to control pollutants from the separated stormwater, such as the treatment and detention of stormwater through the use of stormwater Best Management Practices and reduction of stormwater runoff. Redirection of stormwater to areas supporting less sensitive uses or areas where fewer environmental impacts will result should also be considered.

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